ABSTRACT:

In this paper, a novel method using Bees Algorithm is proposed to determine the optimal allocation of FACTS devices for maximizing the Available Transfer Capability (ATC) of power transactions between source and sink areas in the deregulated power system. The algorithm simultaneously searches the FACTS location, FACTS parameters and FACTS types. Two types of FACTS are simulated in this study namely Thyristor Controlled Series Compensator (TCSC) and Static Var Compensator (SVC). A Repeated Power Flow with FACTS devices including ATC is used to evaluate the feasible ATC value within real and reactive power generation limits, line thermal limits, voltage limits and FACTS operation limits. An IEEE30 bus system is used to demonstrate the effectiveness of the algorithm as an optimization tool to enhance ATC. A Genetic Algorithm technique is used for validation purposes. The results clearly indicate that the introduction of FACTS devices in a right combination of location and parameters could enhance ATC and Bees Algorithm can be efficiently used for this kind of nonlinear integer optimization.